Karlsruher Institut für Technologie

Elektrotechnisches Institut

Masterarbeit

Design of a switched-reluctance motor made of amorphous cores

Themenbereich

Machine design

Schwerpunkte

- ☒ Theorie
- ☒ Literatur
- ☒ Simulation
- ☐ Programmierung
- ☐ Konstruktion
- ☐ Hardware
- ☐ Versuche

Studiengang

- ☒ Elektrotechnik
- ☐ Maschinenbau
- ☐ Mathematik
- ☐ Informatik

Beginn

Ab sofort

Ansprechpartner

M.Eng. Jing Ou

Raum 118
Tel: 0721 608-41783
jing.ou@kit.edu

http://www.eti.kit.edu

Motivation

Switched-reluctance motor (SRM) has many advantages, such as simple and robust structure, low cost, desirable for high-temperature environment and high-speed operations. However, its efficiency is generally low because of high core losses. Hence, by using low losses material to decrease the core losses is a good choice. Amorphous material has not only low core losses, but also high relative permeability. However, the saturation flux density of the amorphous material is much lower than that of the commonly used silicon steel. Thus, the design of the SRM made of amorphous cores should be different which worth a research.

Aufgabenstellung

A SRM made of amorphous material needs to be designed and optimized. To fulfill this target, the following aspects need to be done.

1. Different slot/pole number combinations will be compared in order to find out a proper combination, which has better performance when amorphous material is used.
2. Parallel slot and parallel tooth stator configurations will be compared in terms of the copper losses and torque ability.
3. The shape of the rotor pole will be optimized.
4. The designed SRM with another SRM made of silicon steel NO20 will be compared to show the advantages of using amorphous material.